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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/363,578	07/29/1999	JAE-YUL RYU	003364.P020	8304

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EXAMINER

RUTHKOSKY, MARK

ART UNIT PAPER NUMBER

1745

DATE MAILED: 03/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/363,578	<b>Applicant(s)</b> RYU ET AL.	
	<b>Examiner</b> Mark Ruthkosky	<b>Art Unit</b> 1745	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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## DETAILED ACTION

### *Summary*

This office action is a first response to a CPA filed 8/20/2003 with an amendment filed 12/1/2003.

### *Claim Rejections - 35 U.S.C. § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Kuribayashi et al. ("Battery Characteristics with Various Carbonaceous Materials," Journal of Power Sources 54 (1995) 1-5.)

The instant claims are to a carbonaceous active material comprising at least one crystalline, graphite core, and an amorphous, graphitizable, carbon shell coating the outside of the crystalline graphite core. Differential thermal analysis conducted on the carbonaceous active material in 10°C increments per minute starting from room temperature and proceeding to

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1000°C at atmospheric pressure results in the displaying of at least two exothermic peaks overlapping to form shoulders. The amorphous, graphitizable, carbon shell coating is derived from an amorphous carbon precursor selected from the group consisting of pitch, coal based oil and heavy oil.

Kuribayashi et al. teaches a lithium secondary battery, which comprises particles with a graphite core, surrounded by an amorphous carbon shell. The particles have a graphite structural part and an amorphous type part (see page 1, lines 10-end). The shell is comprised of a coke-like carbon (page 1, col. 2, lines 10-15.) Example 1 and paragraph 1 on page 5 teaches the shell to be pitch-blended phenol resins. Coke is formed from a pitch precursor. The mixture is also a solid solution. Agglomerates are shown in figures 4 and 5. Differential thermal analysis is a means for analyzing the carbon materials. Differential thermal analysis is not taught in the Kuribayashi et al. reference; however, the properties indicated by differential thermal analysis would be inherent. The carbonaceous material would have two, separate, inherent, exothermic peak values based on the graphite material and the non-graphite material. The instant specification does not describe specific graphite and amorphous materials. See, for example, page 5, where it is noted that natural or artificial graphite may be used and various amorphous carbons serve as the other carbon material. The specification discloses that it is known in the art that crystalline graphite has an exothermic peak at 800 °C and that amorphous carbon has an exothermic peak at 700 °C. Thus, the graphite and carbon core materials will inherently have two specific peaks by DTA and the claims are anticipated.

Claims 1-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Ueda et al. (US 6,027,833.)

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Ueda et al. (US 6,027,833) teaches a lithium secondary battery, which comprises particles with a graphite core, surrounded by an amorphous carbon shell. The particles have a graphite structural part and an amorphous type part (claim 1, col. 4, lines 15-35; line 64-col. 5, line 10; and col. 8, lines 5-58.) The shell is comprised of a coke-like carbon (page 1, col. 2, lines 10-15.) The shell is formed from hydrocarbons, pitch, tar, or phenol resins. The particles are added to a solution of an amorphous, graphitizable, carbon shell coating precursor and the material is carbonized at a temperature equivalent to that of the instant specification. Agglomerates are shown in figure 2. Differential thermal analysis is a means for analyzing the carbon materials. Differential thermal analysis is not taught in the reference; however, the properties indicated by differential thermal analysis would be inherent. The carbonaceous material would have two, separate, inherent, exothermic peak values based on the graphite material and the non-graphite material. The instant specification does not describe specific graphite and amorphous materials. See, for example, page 5, where it is noted that natural or artificial graphite may be used and various amorphous carbons serve as the other carbon material. The specification discloses that it is known in the art that crystalline graphite has an exothermic peak at 800 °C and that amorphous carbon has an exothermic peak at 700 °C. Thus, the graphite and carbon core materials will inherently have two specific peaks by DTA and the claims are anticipated.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itoh et al. (6,103,423) in view of Kuribayashi et al. ("Battery Characteristics with Various Carbonaceous Materials," Journal of Power Sources 54 (1995) 1-5.)

Itoh et al. (6,103,423) teaches a lithium secondary battery, which comprises particles with a graphite core, surrounded by an amorphous carbon shell. The particles have a graphite structural part and an amorphous part (see col. 2, line 35 to col. 3, line 35; col. 4, line 25-end; col. 6, lines 20-30 and claims 1-18.) The shell is comprised of hydrocarbon, phenol carbon resins, furan resins and polyamide resins. These materials are functional equivalents used to form the amorphous layer of the instant invention, as shown on page 5 of the instant specification. The particles are added to a solution of an amorphous, graphitizable, carbon shell coating precursor and the material is carbonized at a temperature equivalent to that of the instant specification. Agglomerates are shown in figure 2. The reference does not teach the amorphous carbon precursor is selected from the group consisting of pitch, coal based oil or heavy oil. Differential thermal analysis is a means for analyzing the carbon materials. Differential thermal analysis is not taught in the reference; however, the properties indicated by differential thermal analysis would be inherent. The carbonaceous material would have two, separate, inherent, exothermic peak values based on the graphite material and the non-graphite material. The instant specification does not describe specific graphite and amorphous materials. See, for example, page 5, where it is noted that natural or artificial graphite may be used and various amorphous carbons serve as the other carbon material. The specification discloses that it is known in the art that crystalline graphite has an exothermic peak at 800 °C and that amorphous

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carbon has an exothermic peak at 700 °C. Thus, the graphite and carbon core materials will inherently have two specific peaks by DTA.

Kuribayashi et al. teaches a lithium secondary battery, which comprises particles with a graphite core, surrounded by an amorphous carbon shell. The particles have a graphite structural part and an amorphous type part (see page 1, lines 10-end). The shell is comprised of a coke-like carbon (page 1, col. 2, lines 10-15.) Example 1 and paragraph 1 on page 5 teaches the shell to be pitch-blended phenol resins. Coke is formed from a pitch precursor. The mixture is also a solid solution. Agglomerates are shown in figures 4 and 5. It would be obvious to one of ordinary skill in the art at the time the invention was made to use pitch or other coal based oils as the amorphous carbon precursor as these materials are well described in the art to form an amorphous carbon material as shown in Kuribayashi. Itoh et al. teaches that manner of forming the amorphous layer on the graphite core is not critical (col. 2, line 58.) Precursor materials known in the art are added to the core followed by carbonizing the component to form the composite layer. The composite carbonaceous active material will inherently have two DTA peaks as both the graphite core and the carbonized amorphous coating will have inherent peaks at equivalent temperatures as the material in the instant specification. The artisan would have found the claimed invention to be obvious in light of the teachings of the references.

#### ***Examiner Correspondence***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-

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6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mark Ruthkosky

Primary Patent Examiner

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3/2014